



Committee on Earth Observation Satellites

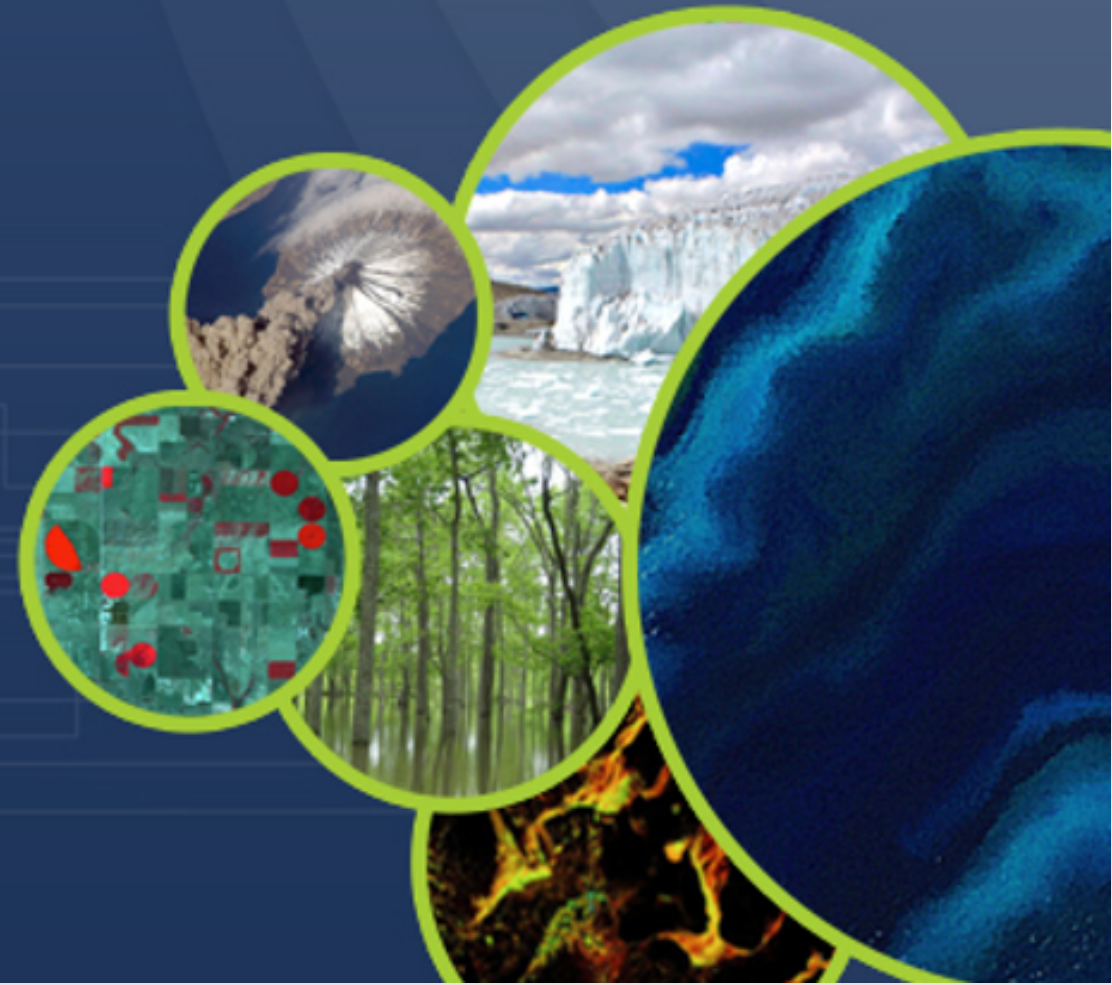
JAXA Agency Report

Akihiko KUZE

(Earth Observation Research Center, Japan Aerospace Exploration Agency)

CEOS WGCV-47

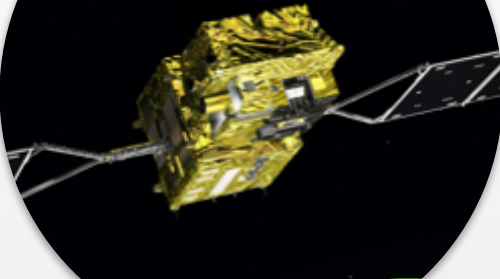
July 17, 2020



Current JAXA Earth Observation Missions



GCOM-C
since 2017



Cloud/
Aerosols/
Vegetation

GOSAT
since 2009



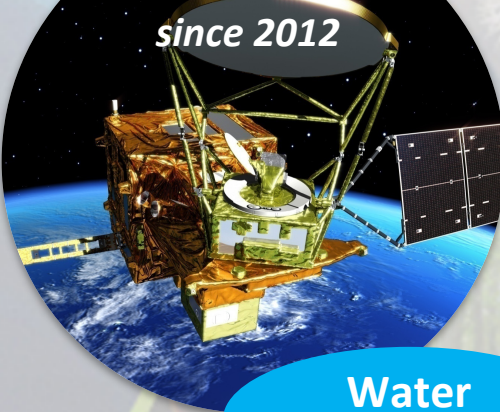
Greenhouse
gases

GOSAT-2
since 2018



Greenhouse
gases

GCOM-W
since 2012



Water
Cycle

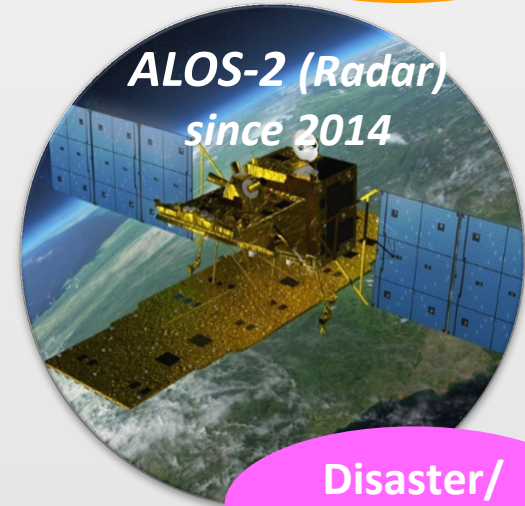
GPM-Core
since 2014



(c) NASA
(NASA-JAXA
joint mission)

Precipitation

ALOS-2 (Radar)
since 2014

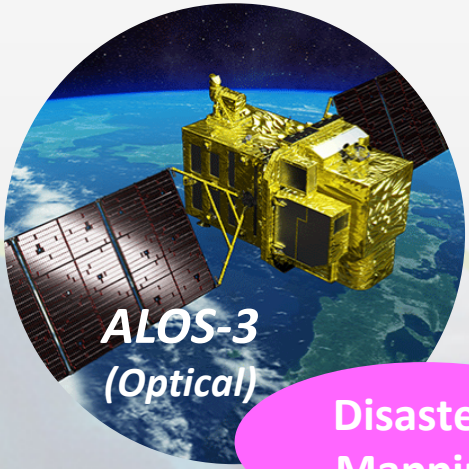


Disaster/
Forest



2020

ALOS-3



Disaster/
Mapping

2021

ALOS-4



Disaster/
Forest

2022

EarthCARE

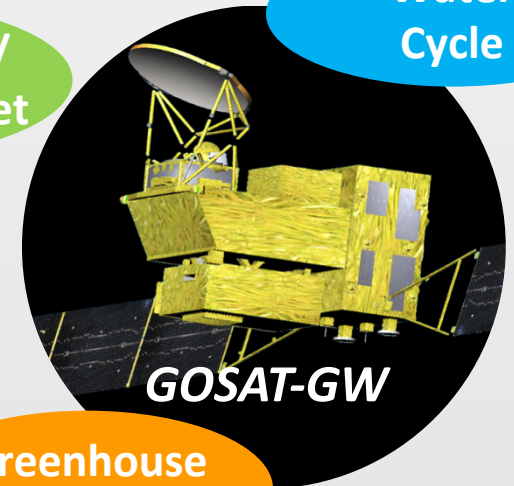


(ESA-JAXA
joint mission)

Cloud/Aerosol/
Radiation Budget

2023

GOSAT-GW



Greenhouse
gases

(MOE Mission)

(JAXA Mission)

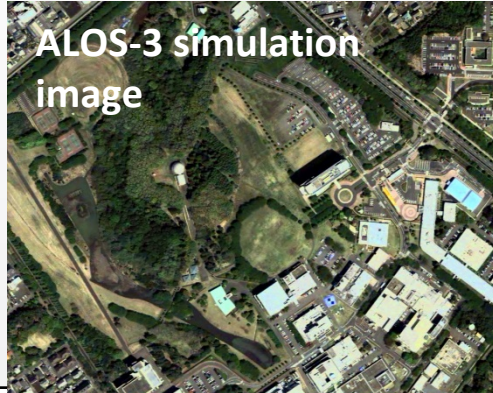
Water
Cycle

Future ALOS series Missions: ALOS-3 Optical (2020) & ALOS-4 L-band SAR (2021)



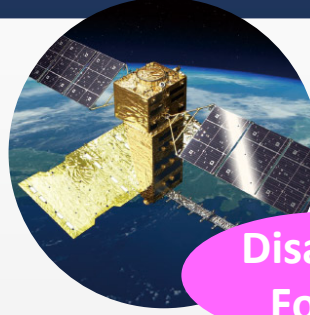
Disaster/
Mapping

**ALOS-3
(Optical)**



ALOS-3 simulation
image

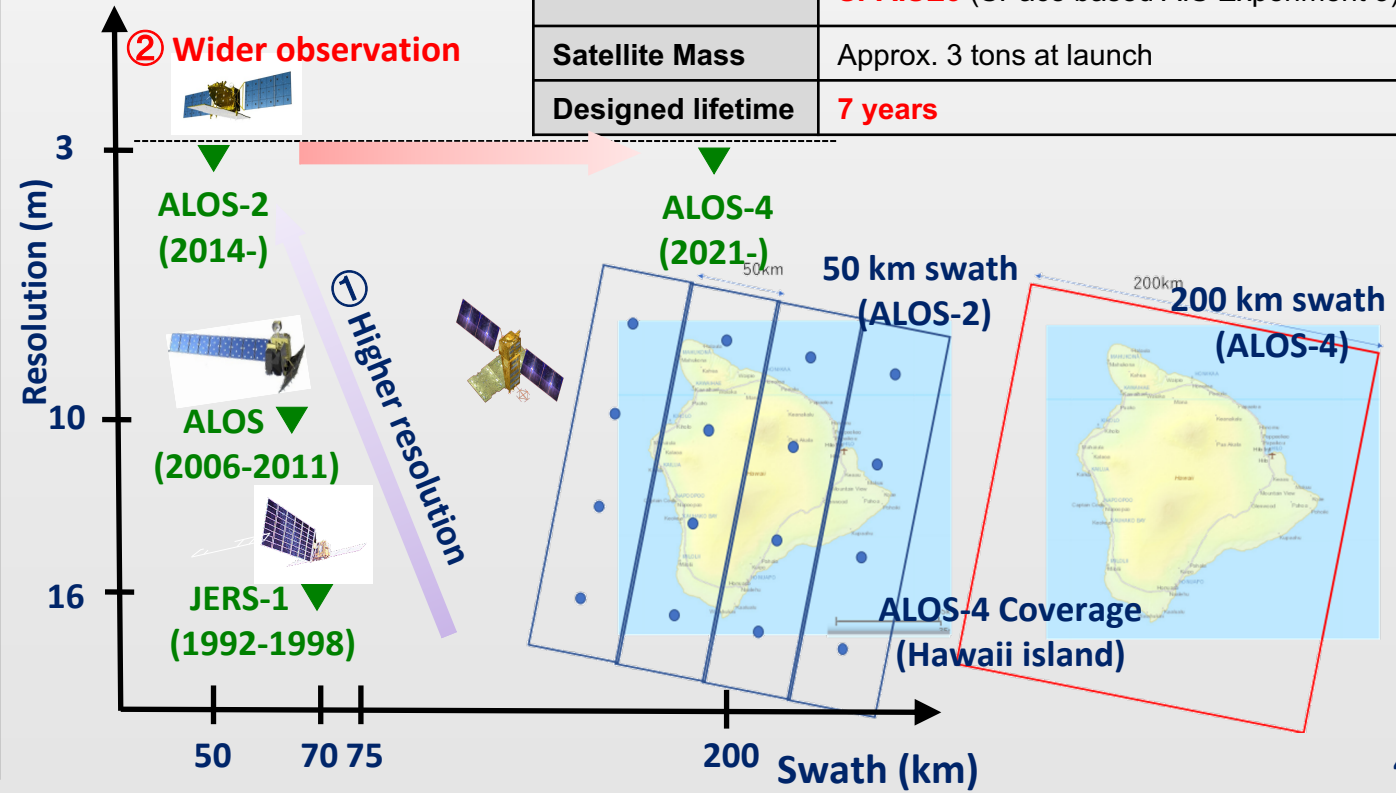
Orbit	Sun-synchronous sub-recurrent Altitude: 669 km at the equator Local Sun Time at Desc: 10:30 am +/- 15 min Revisit time: 35 days (Sub-cycle 3 days)
Instruments	- Wide-swath and high-resolution optical imager - Dual-frequencies Infrared sensor (hosted payload)
Ground Sampling Distance (GSD)	- Panchromatic band (Pa): 0.8 m - Multispectral band (Mu): 3.2 m (6 bands)
Quantization	11 bit / pixel
Swath width	70 km at nadir
Mission data downlink	Direct: Ka and X-band; via. Data Relay Satellite
Satellite Mass	Approx. 3 tons at launch
Duty	10 mins / recurrent
Designed lifetime	7 years



Disaster/
Forest

**ALOS-4
(Radar)**

Orbit	Same orbit as ALOS-2 Altitude: 628 km at the equator Inclination angle: 97.9° Local sun time at Desc.: 12:00 +/- 15 min Revisit time: 14 day (15-3/14 rev/day)
Instruments	PALSAR-3 (Phased Array type L-band Synthetic Aperture Radar-3) SPAISE3 (SPace based AIS Experiment 3)
Satellite Mass	Approx. 3 tons at launch
Designed lifetime	7 years

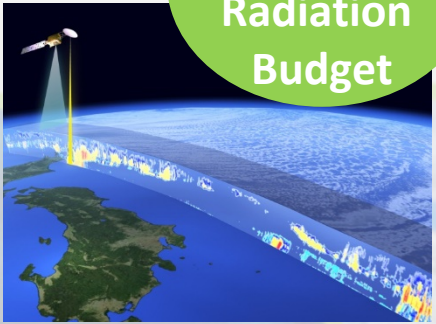


Future Missions for Climate & Water: EarthCARE (2022) & GOSAT-GW (2023)



EarthCARE

Cloud/
Aerosol/
Radiation
Budget



- Europe-Japan joint mission
- Targeting to measure three-dimensional global distributions of cloud and aerosol to contribute to precise understanding of climate change
- JAXA and NICT provides the world's first satellite-based cloud vertical motion by the Cloud Profiling Radar (CPR) with 94 GHz with Doppler Capability at 0.8 km spatial resolution.

Orbit	Sun-synchronous sub-recurrent orbit Altitude: approx. 400km Inclination angle: 97.05° Local Sun Time at Desc.: 14:00 Revisit time: 25 days
Instruments	- Cloud Profiling Radar (CPR) by NICT & JAXA - Atmospheric Lidar (ATLID) by ESA - Multi-Spectral Imager (MSI) by ESA - Broad-Band Radiometer (BBR) by ESA
Mass	Approx. 2.2 tons at launch
Designed lifetime	3 years



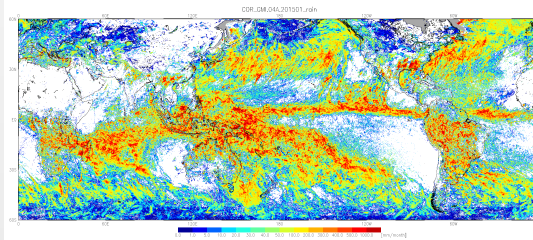
GOSAT-GW

Water
Cycle

Green-
house
gases

- Carrying two instruments, AMSR3 and TANSO-3.
- AMSR3 (JAXA) will succeed AMSR series observations adding new high frequency channels (166 & 183 GHz) for snow fall retrievals and water vapor analysis for numerical weather prediction.
- TANSO-3 (led by Ministry of Environment in Japan) uses imaging spectrometer technology to measure CO₂, CH₄ and NO₂ globally with medium and locally with high spatial resolution.

AMSR3 for both snow & rain



Orbit	Sun-synchronous sub-recurrent orbit Altitude: approx. 666km Inclination angle: 98.06° Local Sun Time at Desc.: 1:30 +/- 15 min Revisit time: 3 days
Instruments	- Advanced Microwave Scanning Radiometer 3 (AMSR3) - Total Anthropogenic and Natural emissions mapping Spectrometer-3 (TANSO-3) (for Ministry of Environment in Japan (MOE))
Mass	Approx. 2.6 tons at launch
Designed lifetime	7 years



JAXA for Earth

- Earth Data Collection by JAXA Satellites -

To watch over the global environment and human society from space...

This site introduces various aspects of the earth using JAXA's research results and data.

Last Update : 2020-06-30

Satellite ▾

Research Field ▾

Area ▾

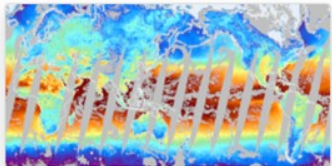
Application ▾

Others...

☐ For Beginners

JAXA Sites **52**

Partner's Sites **15**



AMSR Earth Environment Viewer

This site provides global observation images and data by Advanced Microwave Scanning Radiometer (AMSR) series on board GCOM-W etc. Available in near-real-time, visualization and download with user customize. **New!!**

Updating 2002/06- Web Map

Download



JAXA for Earth on COVID-19

JAXA's earth observation satellites are monitoring the earth's surface to detect the changes in the global environment and human society related to COVID-19. This site introduces the latest observation and analysis results. **New!!**



G-Portal

G-Portal is a portal system allowing users to search (satellite/sensor/physical quantity), and download products acquired by JAXA's Earth observation satellite.

Updating Search Download



ALOS/ALOS2 User Interface Gateway2 (AUIG2)

This online system allows users to search for ALOS and ALOS-2 observation data and plans (authorized users can also order observation data. Guest users can only view observation data and observation plans).

Updating 2006/02- Search

Released on May 11.

All the JAXA EO sites can be accessed from a single top page.

Total of 52 sites

June 25

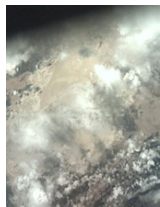
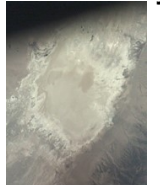
COVID-19 dashboard added.
CO₂ enhancement difference between previous years and 2020 in 7 cities by GOSAT etc.



Joint Vicarious Calibration Campaign 2020

OCO-2, -3, TROPOMI, GOSAT, GOSAT-2



	June 22	June 23	June 24	June 25	June 26	June 27	June 28
GOSAT	✓	✓		✓	✓		✓
GOSAT-2					✓	✓	✓
OCO-2				✓	✓	✓	
OCO-3					✓		
TROPOMI	✓	✓	✓ Nadir	✓ Nadir	✓	✓	✓
Surface							
Weather							
	June 29	June 30	July 1	July 2	July 3	July 4	July 5
GOSAT	✓		✓	✓		✓	✓
GOSAT-2			✓	✓	✓		
OCO-2							✓
OCO-3		✓				✓	
TROPOMI	✓ Nadir	✓ Nadir	✓ Nadir	✓ Nadir	✓	✓	✓ Nadir
Surface						✓	✓
Weather						Golden Day 	Golden day 